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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/667,320	SHIMOJO ET AL.	
	Examiner	Art Unit	
	VAIBHAV (MANU) SAWHNEY	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *23 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/23/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-18 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-18 of U.S. Patent No. 6,643,256 (Shimojo et al.) in view of Aimoto (6,967,924).

Instant Application (10,667,320)	US Patent No. 6,643,256
Claim 1. A packet switch, comprising: a plurality of input side transfer units from which packets are entered; a plurality of output side transfer units from which packets are outputted; a switching unit through which each packet entered from each input side transfer unit is switched to a desired output side transfer unit; a congestion status monitoring unit configured to monitor a congestion status of **one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach** within the **switching unit**; a priority level attaching unit configured to attach a priority level to each packet, according to the congestion status of a transfer target of each packet monitored by the congestion status monitoring unit; and a packet selection unit configured to select one packet that is to be transferred at a higher priority among colliding packets when a packet collision occurs within the switching unit, according to the priority level attached to each colliding packet.	**Claim 1.** A packet switch, comprising: a plurality of input side transfer units from which packets are entered; a plurality of output side transfer units from which packets are outputted; a switching unit through which each packet entered from each input side transfer unit is switched to a desired output side transfer unit; a congestion status monitoring unit configured to monitor a congestion status of each transfer target within the packet switch; a priority level attaching unit configured to attach a priority level to each packet, according to the congestion status of a transfer target of each packet monitored by the congestion status monitoring unit; and a packet selection unit configured to select one packet that is to be transferred at a higher priority among colliding packets when a packet collision occurs within the switching unit, according to the priority level attached to each colliding packet.
Claim 2. The packet switch of claim 1, wherein the priority level attaching unit attaches a lower priority level to a packet for which a congestion level of **one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach** is higher.	**Claim 2.** The packet switch of claim 1, wherein the priority level attaching unit attaches a lower priority level to a packet for which a congestion level of a transfer target is higher.
Claim 3. The packet switch of claim 1, wherein the priority level attaching unit is provided inside each input side transfer unit.	**Claim 3.** The packet switch of claim 1, wherein the priority level attaching unit is provided inside each input side transfer unit.

Claim 4. The packet switch of claim 1, wherein the priority level attaching unit sets a temporarily high priority level to one or a plurality of packets that are to be transferred to one **of said output side transfer units** initially when the congestion status of said one **of said output side transfer units** that is referred in order to attach the priority level to each packet is unknown or invalid.	**Claim 4.** The packet switch of claim 1, wherein the priority level attaching unit sets a temporarily high priority level to one or a plurality of packets that are to be transferred to one transfer target initially when the congestion status of said one transfer target that is referred in order to attach the priority level to each packet is unknown or invalid.
Claim 5. The packet switch of claim 1, wherein the priority level attaching unit sets the priority level to be attached to each packet by referring to a congestion level table that stores a congestion level set to each prescribed **one of said output side transfer units** according to the congestion status monitored by the congestion status monitoring unit, the congestion level table being provided for each one or a plurality of the input side transfer units.	**Claim 5.** The packet switch of claim 1, wherein the priority level attaching unit sets the priority level to be attached to each packet by referring to a congestion level table that stores a congestion level set to each prescribed transfer target according to the congestion status monitored by the congestion status monitoring unit, the congestion level table being provided for each one or a plurality of the input side transfer units.
Claim 6. The packet switch of claim 1, wherein the congestion status monitoring unit is provided inside each output side transfer unit.	**Claim 6.** The packet switch of claim 1, wherein the congestion status monitoring unit is provided inside each output side transfer unit.
Claim 7. The packet switch of claim 6, wherein the congestion status monitoring unit monitors the congestion status of each prescribed **one of said output side transfer units** for a corresponding output side transfer unit, each class of the corresponding output side transfer unit, each port of the corresponding output side transfer unit, each classes of each port of the corresponding output side transfer unit, or each flow of each class of each port of the corresponding output side transfer unit.	**Claim 7.** The packet switch of claim 6, wherein the congestion status monitoring unit monitors the congestion status of each prescribed transfer target for a corresponding output side transfer unit, each class of the corresponding output side transfer unit, each port of the corresponding output side transfer unit, each classes of each port of the corresponding output side transfer unit, or each flow of each class of each port of the corresponding output side transfer unit.
Claim 8. The packet switch of claim 1, wherein the congestion status monitoring unit notifies a monitored congestion status such that the monitored congestion status is reflected into the priority level attached	**Claim 8.** The packet switch of claim 1, wherein the congestion status monitoring unit notifies a monitored congestion status such that the monitored congestion status is reflected into the priority level attached

by the priority level attaching unit.	by the priority level attaching unit.
Claim 9. The packet switch of claim 8, wherein the priority level attaching unit is provided inside each input side transfer unit, and the congestion status monitoring unit notifies a prescribed information regarding the monitored congestion status to one input side transfer unit that has transmitted one packet, at a timing of arrival of said one packet to the output side transfer unit.	**Claim 9.** The packet switch of claim 8, wherein the priority level attaching unit is provided inside each input side transfer unit, and the congestion status monitoring unit notifies a prescribed information regarding the monitored congestion status to one input side transfer unit that has transmitted one packet, at a timing of arrival of said one packet to the output side transfer unit.
Claim 10. The packet switch of claim 1, further comprising: a scheduling unit provided for each input side transfer unit and configured to control an order of transfers of a plurality of packets that are waiting for transfers to the switching unit at each input side transfer unit, such that those packets destined to non-congested **one of said output side transfer units** are transferred to the switching unit at higher priority by accounting for the congestion status of **one of said output side transfer units to which a packet from one of said input side transfer units are destined to reach**.	**Claim 10.** The packet switch of claim 1, further comprising: a scheduling unit provided for each input side transfer unit and configured to control an order of transfers of a plurality of packets that are waiting for transfers to the switching unit at each input side transfer unit, such that those packets destined to non-congested transfer targets are transferred to the switching unit at higher priority by accounting for the congestion status of a transfer target of each packet.
Claim 11. The packet switch of claim 1, wherein a packet with the priority level attached thereto is transferred from a input side transfer unit via the switching unit to a output side transfer unit, the switching unit transfers one colliding packet selected from colliding packets by accounting for the priority level attached to each colliding packet, to the output side transfer unit when a packet collision occurs inside the switching unit while discarding other colliding packets inside the switching unit, the input side transfer unit re-transmits each discarded packet when a packet discarding due to the packet collision is detected, and the priority level attaching unit is provided at the input side transfer	**Claim 11.** The packet switch of claim 1, wherein a packet with the priority level attached thereto is transferred from a input side transfer unit via the switching unit to a output side transfer unit, the switching unit transfers one colliding packet selected from colliding packets by accounting for the priority level attached to each colliding packet, to the output side transfer unit when a packet collision occurs inside the switching unit while discarding other colliding packets inside the switching unit, the input side transfer unit re-transmits each discarded packet when a packet discarding due to the packet collision is detected, and the priority level attaching unit is provided at the input side transfer

unit and sets the priority level to be attached to each re-transmission packet higher than the priority level originally attached to a corresponding discarded packet.	unit and sets the priority level to be attached to each re-transmission packet higher than the priority level originally attached to a corresponding discarded packet.
Claim 12. The packet switch of claim 1, wherein a packet with the priority level attached thereto is transferred from a input side transfer unit via the switching unit to an output side transfer unit, the switching unit transfers one colliding packet selected from colliding packets by accounting for the priority level attached to each colliding packet, at higher priority to the output side transfer unit when a packet collision occurs inside the switching unit, the priority level attaching unit is provided at the input side transfer unit, and when a plurality of packets subdividing one data are to be transferred from the input side transfer unit, the priority level attaching unit sets the priority level of one packet corresponding to a top portion of said one data lower than the priority level of other packets corresponding to subsequent portions of said one data.	**Claim 12.** The packet switch of claim 1, wherein a packet with the priority level attached thereto is transferred from a input side transfer unit via the switching unit to an output side transfer unit, the switching unit transfers one colliding packet selected from colliding packets by accounting for the priority level attached to each colliding packet, at higher priority to the output side transfer unit when a packet collision occurs inside the switching unit, the priority level attaching unit is provided at the input side transfer unit, and when a plurality of packets subdividing one data are to be transferred from the input side transfer unit, the priority level attaching unit sets the priority level of one packet corresponding to a top portion of said one data lower than the priority level of other packets corresponding to subsequent portions of said one data.
Claim 13. The packet switch of claim 12, wherein the priority level attaching unit sets the priority level of said one packet than the priority level of the other packets by setting the priority level of the other packets higher than the priority level attached to packets that do not belong to said plurality of packets subdividing one data.	**Claim 13.** The packet switch of claim 12, wherein the priority level attaching unit sets the priority level of said one packet than the priority level of the other packets by setting the priority level of the other packets higher than the priority level attached to packets that do not belong to said plurality of packets subdividing one data.
Claim 14. The packet switch of claim 1, wherein each input side transfer unit transfers a packet along with the congestion status inside the input side transfer unit at a time of transferring the packet via the switching unit to an output side transfer unit, and the output side	**Claim 14.** The packet switch of claim 1, wherein each input side transfer unit transfers a packet along with the congestion status inside the input side transfer unit at a time of transferring the packet via the switching unit to an output side transfer unit, and the output side

transfer unit obtains a comprehensive congestion status using the congestion status inside the input side transfer unit that is notified along with the packet and the congestion status inside the output side transfer unit, and carries out a congestion control using the comprehensive congestion status in order to control an amount or a rate of packet flows flowing through a network in which the packet switch is provided.	transfer unit obtains a comprehensive congestion status using the congestion status inside the input side transfer unit that is notified along with the packet and the congestion status inside the output side transfer unit, and carries out a congestion control using the comprehensive congestion status in order to control an amount or a rate of packet flows flowing through a network in which the packet switch is provided.
Claim 15. A packet switch, comprising: a plurality of input side transfer units from which packets are entered; a plurality of output side transfer units from which packets are outputted; a switching unit through which each packet entered from each input side transfer unit is switched to a desired output side transfer unit, the switching unit having a configuration in which no packet collision occurs; a congestion status monitoring unit configured to monitor a congestion status of **one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach within the switching unit** to which each packet can be destined to reach within the packet switch; and a connection pattern calculation engine configured to attach a priority level to each packet, according to the congestion status of **one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach within is** monitored by the congestion status monitoring unit, carry out a simulation in which each packet is assumed to be transferred through a virtual switching network having a topology in which a packet collision may occur and a packet to be transferred at higher priority among colliding packets is selected according to the priority level attached to	**Claim 15.** A packet switch, comprising: a plurality of input side transfer units from which packets are entered; a plurality of output side transfer units from which packets are outputted; a switching unit through which each packet entered from each input side transfer unit is switched to a desired output side transfer unit, the switching unit having a configuration in which no packet collision occurs; a congestion status monitoring unit configured to monitor a congestion status of each prescribed transfer target to which each packet can be destined to reach within the packet switch; and a connection pattern calculation engine configured to attach a priority level to each packet, according to the congestion status of a transfer target of each packet monitored by the congestion status monitoring unit, carry out a simulation in which each packet is assumed to be transferred through a virtual switching network having a topology in which a packet collision may occur and a packet to be transferred at higher priority among colliding packets is selected according to the priority level attached to each colliding packet when the packet collision occurs in the virtual switching network, and determine a connection pattern of the switching unit such that a result of switching packets at the switching unit coincides with a result of

each colliding packet when the packet collision occurs in the virtual switching network, and determine a connection pattern of the switching unit such that a result of switching packets at the switching unit coincides with a result of transferring packets from the input side transfer units to the output side transfer units according to the simulation.	transferring packets from the input side transfer units to the output side transfer units according to the simulation.
Claim 16. The packet switch of claim 15, wherein the switching unit is formed by a cross-bar switch, and the virtual switching network is a switching network formed by switching elements.	**Claim 16.** The packet switch of claim 15, wherein the switching unit is formed by a cross-bar switch, and the virtual switching network is a switching network formed by switching elements.
Claim 17. A packet switching method of a packet switch in which a packet is transferred from an input side transfer unit via a switching unit to a desired output side transfer unit, the method comprising: transferring the packet by attaching a priority level according to a congestion status of **one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach**; switching the packet transferred from the input side transfer unit according to **one of said output side transfer units** of the packet at the switching unit, and transferring one colliding packet selected from colliding packets by accounting for the priority level attached to each colliding packet, at higher priority to the output side transfer unit when a packet collision occurs within the switching unit; and notifying information indicating a monitoring result of the congestion status for a prescribed unit of monitoring, from the output side transfer unit to which the packet has reached, to the input side transfer unit which transmitted the packet.	**Claim 17.** A packet switching method of a packet switch in which a packet is transferred from an input side transfer unit via a switching unit to a desired output side transfer unit, the method comprising: transferring the packet by attaching a priority level according to a congestion status of a transfer target of the packet to which the packet is destined to reach within the packet switch, from the input side transfer unit to the switching unit; switching the packet transferred from the input side transfer unit according to the transfer target of the packet at the switching unit, and transferring one colliding packet selected from colliding packets by accounting for the priority level attached to each colliding packet, at higher priority to the output side transfer unit when a packet collision occurs within the switching unit; and notifying information indicating a monitoring result of the congestion status for a prescribed unit of monitoring, from the output side transfer unit to which the packet has reached, to the input side transfer unit which transmitted the packet.

Claim 18. A computer program product for causing one or a plurality of a computers to function as a packet switch in which a packet is transferred from an input side transfer unit via a switching unit to a desired output side transfer unit, the switching unit having a function of selecting **a priority level attached** packet that is to be transferred at a higher priority among colliding packets when a packet collision occurs within the switching unit, according to a priority level attached to each colliding packet, the computer program product comprising: a first computer readable program code for causing said one or a plurality of computers to monitor a congestion status of **one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach** to which each packet can be destined to reach within the packet switch; and a second computer readable program code for causing said one or a plurality of computers to attach the priority level to each packet, according to the congestion status of **one of said output side transfer units which is** monitored by the first computer readable program code.	**Claim 18.** A computer program product for causing one or a plurality of a computers to function as a packet switch in which a packet is transferred from an input side transfer unit via a switching unit to a desired output side transfer unit, the switching unit having a function of selecting one packet that is to be transferred at a higher priority among colliding packets when a packet collision occurs within the switching unit, according to a priority level attached to each colliding packet, the computer program product comprising: a first computer readable program code for causing said one or a plurality of computers to monitor a congestion status of each transfer target to which each packet can be destined to reach within the packet switch; and a second computer readable program code for causing said one or a plurality of computers to attach the priority level to each packet, according to the congestion status of a transfer target of each packet monitored by the first computer readable program code.

As to claims 1, 2, 4, 5, 7, 10, 15, 17, and 18, reference claims of 6,643,256 do not disclose the following:

(Claim 1) one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach within the switching unit.

(Claim 2) one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach.

(Claim 4) ...of said output side transfer units...

(Claim 5) ...one of said output side transfer units...

(Claim 7) ... one of said output side transfer units...

(Claim 10) ... one of said output side transfer units... and ... one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach.

(Claim 15) ...one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach within the switching unit...

(Claim 17) ... one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach and ...one of said output side transfer units...

(Claim 18) ... one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach...and ...one of said output side transfer units which is...

Aimoto (6,697,924) shows ... one of said output side transfer units to which a packet from one of said input side transfer units (Fig. 1, units 102-1 to 102-N are the input ports) is destined to reach (Col. 4, lines 57-64; Fig. 1, unit 100) ...and ...one of said output side transfer units which is...(Fig. 1, units 108-1 to 108-N are the output ports). Therefore. It would have been obvious to one of ordinary skilled in the art at the time of invention to modify the packet switch of Shimojo et al. to switch packets from various

input ports to various output ports to correctly switch the data to correct destinations for efficient switching, thus avoiding data loss and conserve network resources.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The claimed invention is directed to non-statutory subject matter.

Claim 18 is rejected under 35 U.S.C. 101 because it states: "A computer program product for causing..." This language is non-statutory. It is suggested to state: "A computer readable medium storing a computer program for causing..." Appropriate action is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 12 and 13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The statement "...subdividing the data..." is not enabling as to how one data

unit can be subdivided and different level of priority attached to subdivided data unit. Appropriate action is required.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The statement "... subdividing one data" and attaching different priority level to various subdivisions of one data is not clear and indefinite. Appropriate action is required.

8. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation "determine a connection pattern of the switching unit such that a result of switching packets at the switching unit coincides with a result of transferring packets from the input side transfer units to the output side transfer units according to the simulation" is unclear and indefinite as to what does connection pattern mean and also the meaning of simulation in unclear. Appropriate action is required.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1, 3, 4, 8, 9, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aimoto (6,967,924), in view of Ganesh et al. (6,347,087), in further view of Weizman (5,940,399).

As to claim 1, Aimoto shows a packet switch (Fig. 1, unit 100), comprising: a plurality of input side transfer units (Fig. 1, units 102-1 – 102-N; Col. 5, lines 38-40) from which packets are entered; a plurality of output side transfer units from which packets are outputted (Fig. 1, units 108-1 – 108-N; Col. 5, lines 41-43); a switching unit (Fig. 1, unit 120; Col. 5, lines 45-47) through which each packet entered from each input side transfer unit is switched to a desired output side transfer unit; and a congestion status monitoring unit (Fig. 1, unit 106; Col. 5, lines 50-51) configured to monitor a congestion status (Col. 4, line 3) of one of said output side transfer units (Col. 4, lines 4-5, output ports) to which a packet from one of said input side transfer units (Col. 4, lines 5-6) is destined to reach within the switching unit (Col. 4, lines 2-7; Fig. 1, unit 100).

However, Aimoto does not show a packet switch comprising a priority level attaching unit configured to attach a priority level to each packet; and a packet selection

unit configured to select one priority level attached packet that is to be transferred at a higher priority among colliding packets when a packet collision occurs within the switching unit, according to the priority level attached to each colliding packet.

Ganesh et al. show a packet switch (Fig. 1, unit 20) comprising a priority level-attaching unit (Fig. 3, unit 60) configured to attach a priority level to each packet (Fig. 3, unit 60/content-based forwarding logic changes/(attaches a new) the priority of the incoming frame/packet in the ingress port/unit 74; Col. 6, lines 10-14). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Aimoto to include setting priority in the ingress port based on the congestion of the output port to avoid further network congestion and avoid loss of data wherein data is lost/discarded if there is heavy congestion.

Weizman shows a packet selection unit (Fig. 4, arbiter) is configured to select one priority level attached packet (Fig. 5) that is to be transferred at a higher priority among colliding packets when a packet collision occurs within the switching unit, according to the priority level attached to each colliding packet (Col. 11, lines 18-27; "when there is a collision, frame transmission priority of the frames involved in the collision can be examined by the arbiter and the station or port with the higher priority frame to transmit can be given permission to transmit first"). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Aimoto to provide quality of service to higher priority data.

As to claim 3, Aimoto shows all the elements except a packet switch wherein the priority level attaching unit is provided inside each input side transfer unit.

Ganesh et al. show a packet switch (Fig. 1, unit 20) wherein the priority level-attaching unit (Fig. 3, unit 60/content-base forwarding logic changes/(attaches a new) the priority of the incoming frame/packet; Col. 4 lines 10-14) is provided inside each input side transfer unit (Fig. 3, unit 74/input port). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Aimoto to include setting priority in the ingress port based on the congestion of the output port to avoid further network congestion and avoid loss of data wherein data is lost/discarded if there is heavy congestion.

As to claim 4, Aimoto shows a packet switch wherein a congestion status level being monitored by a congestion level monitoring unit (Fig. 1, unit 106; Col. 5, lines 50-51) configured to monitor a congestion status (Col. 4, line 3; thus congestion status can be checked if it is valid or invalid) of one of said output side transfer units (Col. 4, lines 4-5, output ports).

However, Aimoto and Weizman do not show a packet switch wherein the priority level attaching unit sets a temporarily high priority level to one or a plurality of packets that are to be transferred to one of said output side transfer units initially.

Ganesh et al. show a packet switch (Fig. 1, unit 20) comprising a priority level-attaching unit (Fig. 3, unit 60) sets a temporarily high priority level to one or a plurality of

packets (Fig. 3, unit 60/content-based forwarding logic changes/(attaches a new) the priority of the incoming frame/packet in the ingress port/unit 74; Col. 6, lines 10-14; further priority can be overwritten dynamically, Col. 4, line 20, that is, an initial/temporary priority is assigned to incoming packet and then that priority is overwritten as well), that are to be transferred to one of said output side transfer units (Col. 6, lines 4-5).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Aimoto to include setting a temporary high priority in the ingress port based on the known or unknown congestion of the output port to avoid further network congestion and avoid loss of data wherein data is lost/discarded if there is heavy congestion and the packets have a lower priority.

As to claim 8, Aimoto shows a packet switch wherein the congestion status monitoring unit (Fig. 1, unit 106; Col. 5, lines 50-51) notifies a monitored congestion status (Col. 4, line 3) such that the monitored congestion status is reflected (Col. 4, lines 3-7).

However, Aimoto does not show a packet switch wherein priority level is attached by the priority level attaching unit.

Ganesh et al. show a packet switch (Fig. 1, unit 20) comprising a priority level-attaching unit (Fig. 3, unit 60) configured to attach a priority level to each packet (Fig. 3, unit 60/content-based forwarding logic changes/(attaches a new) the priority of the incoming frame/packet in the ingress port/unit 74; Col. 6, lines 10-14). Therefore, it

would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Aimoto to include setting priority in the ingress port based on the congestion of the output port to avoid further network congestion and avoid loss of data wherein data is lost/discarded if there is heavy congestion.

As to claim 9, Aimoto shows a packet switch (Fig. 1, unit 100) wherein the congestion status monitoring unit (Fig. 1, unit 106; Col. 5, lines 50-51) notifies a prescribed information regarding the monitored congestion status (Col. 4, line 3) to one input side transfer unit that has transmitted one packet at a timing of arrival of said one packet to the output side transfer unit (Col. 4, lines 3-5).

However, Aimoto does not show a packet switch wherein the priority level attaching unit is provided inside each input side transfer unit.

Ganesh et al. show a packet switch (Fig. 1, unit 20) wherein the priority level-attaching unit (Fig. 3, unit 60/content-base forwarding logic changes/(attaches a new) the priority of the incoming frame/packet; Col. 4 lines 10-14) is provided inside each input side transfer unit (Fig. 3, unit 74/input port). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Aimoto to include setting priority in the ingress port based on the congestion of the output port to avoid further network congestion and avoid loss of data wherein data is lost/discarded if there is heavy congestion.

As to claim 17, Aimoto shows a packet switching method wherein switching the packet transferred from the input side transfer unit according to one of said output side transfer units of the packet at the switching unit (Fig. 1, unit 120; Col. 5, lines 45-47) and notifying information indicating a monitoring result of the congestion status (Col. 4, line 3) for a prescribed unit of monitoring, from the output side transfer unit (Col. 4, lines 4-6) to which the packet has reached, to the input side transfer unit which transmitted the packet (Col. 4, lines 2-7; Fig. 1, unit 100).

However, Aimoto does not show a packet switching method wherein transferring the packet by attaching a priority level from the input side transfer unit to the switching unit and transferring one colliding packet selected from colliding packets by accounting for the priority level attached to each colliding packet, at higher priority to the output side transfer unit when a packet collision occurs within the switching unit.

Ganesh et al. show a packet switching method (Fig. 1, unit 20 doing the function of switching) comprising a priority level-attaching unit (Fig. 3, unit 60) configured to attach a priority level to each packet (Fig. 3, unit 60/content-based forwarding logic changes/(attaches a new) the priority of the incoming frame/packet in the ingress port/unit 74; Col. 6, lines 10-14). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Aimoto to include setting priority in the ingress port based on the congestion of the output port to avoid further network congestion and avoid loss of data wherein data is lost/discarded if there is heavy congestion.

Weizman shows a packet switching method (Fig. 4, arbiter) wherein transferring one colliding packet selected from colliding packets by accounting for the priority level attached (Fig. 5) to each colliding packet, at higher priority to the output side transfer unit when a packet collision occurs within the switching unit (Col. 11, lines 18-27; "when there is a collision, frame transmission priority of the frames involved in the collision can be examined by the arbiter and the station or port with the higher priority frame to transmit can be given permission to transmit first"). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Aimoto to provide quality of service to higher priority data.

11. Claims 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aimoto (6,967,924), in view of Ganesh et al. (6,347,087), in further view of Weizman (5,940,399), further in view of Smith et al. (6,222,823).

As to claim 2, Aimoto shows a congestion status level being monitored by a congestion level monitoring unit (Fig. 1, unit 106; Col. 5, lines 50-51) configured to monitor a congestion status (Col. 4, line 3) of one of said output side transfer units (Col. 4, lines 4-5, output ports) to which a packet from one of said input side transfer units (Col. 4, lines 5-6) is destined to reach within the switching unit (Col. 4, lines 2-7; Fig. 1, unit 100).

However, Aimoto, Ganesh et al., and Weizman do not show a packet switch wherein the priority level attaching unit attaches a lower priority level to a packet for

which a congestion level of one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach is higher.

Smith et al. show a packet switch (Fig. 1, unit 12) wherein the priority level attaching unit (Fig. 1, unit 22/upc/usage parameter control device) attaches a lower priority level to a packet (Col. 5, lines 9-12; upc 22 dynamically alters/changes/lowers the priority of data cells/packets received at the input port of the network).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Aimoto, Ganesh et al., and Weizman to avoid discarding data by altering/lowering priority of data packets if there is congestion, thus, avoid data loss and congestion.

12. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aimoto (6,967,924), in view of Ganesh et al. (6,347,087), in further view of Weizman (5,940,399), further in view of Gun et al. (5,777,984).

As to claim 6, Aimoto, Ganesh et al., and Weizman show all the elements except a packet switch wherein the congestion status-monitoring unit is provided inside each output side transfer unit.

Gun et al. show a packet switch (Fig. 4, unit 120) wherein the congestion status-monitoring unit (Col. 9, lines 10-14; congestion control/monitoring is being performed) is provided inside each output side transfer unit (Col. 9, lines 10-14; egress processors;

Col. 8, lines 55-56 show egress switch ports include an egress processor). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Aimoto, Ganesh et al., and Weizman to include the congestion control on every port to reduce the load off of the main switch processor/central CPU).

As to claim 7, Aimoto shows a packet switch (Fig. 1, unit 100) wherein the congestion status monitoring unit (Fig. 1, unit 106; Col. 5, lines 50-51) monitors the congestion status (Col. 4, line 3) of each prescribed one of said output side transfer units for a corresponding output side transfer unit (Col. 4, lines 3-5) and in each port of the corresponding output side transfer unit (Col. 4, lines 3-5).

13. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aimoto (6,967,924), in view of Ganesh et al. (6,347,087), in further view of Weizman (5,940,399), further in view of Holden et al. (6,396,809).

As to claim 11, Aimoto and Weizman show all the elements except a packet switch wherein the input side transfer unit re-transmits each discarded packet when a packet discarding due to the packet collision is detected, and the priority level attaching unit is provided at the input side transfer unit and sets the priority level to be attached to each re-transmission packet higher than the priority level originally attached to a corresponding discarded packet.

Ganesh et al. show a packet switch (Fig. 1, unit 20) comprising a priority level-attaching unit (Fig. 3, unit 60) at the input side transfer unit (Fig. 3, unit 74/input port) and sets the priority level to be attached to each re-transmission packet higher than the priority level originally attached to a corresponding discarded packet (Fig. 3, unit 60/content-based forwarding logic changes/(attaches a new) the priority of the incoming frame/packet in the ingress port/unit 74; Col. 6, lines 10-14; further priority can be overwritten dynamically, Col. 4, line 20, that is, an initial/temporary priority is assigned to incoming packet and then that priority is overwritten/assigned higher or lower, as well), that are to be transferred to one of said output side transfer units (Col. 6, lines 4-5).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Aimoto and Weizman to provide quality of service in the network.

Holden et al. show a packet switch (Fig. 4, ATM Quad switch) wherein the input side transfer unit (Col. 10, line 36; input ports) re-transmits each discarded packet when a packet discarding due to the packet collision is detected (Col. 10, lines 1-9; it shows when there is blockage in the switch fabric/congestion, then it sends NACK signal back to input ports, and the input ports retransmit the packet/cell). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Aimoto and Weizman to avoid data loss by retransmitting data.

14. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aimoto (6,967,924), in view of Ganesh et al. (6,347,087), in further view of Weizman (5,940,399), further in view of Fichou et al. (5,790,522).

As to claim 14, Aimoto shows a packet switch (Fig. 1, unit 100) wherein the output side transfer unit (Fig. 1, units 108-1 – 108-N; Col. 5, lines 41-43) obtains a comprehensive congestion status (Col. 4, line 3) inside the output side transfer unit (Col. 4, lines 4-5, output ports; Col. 4, lines 2-7; Fig. 1, unit 100).

However, Aimoto does not show a packet switch wherein each input side transfer unit transfers a packet along with the congestion status inside the input side transfer unit at a time of transferring the packet via the switching unit to an output side transfer unit and carries out a congestion control using the comprehensive congestion status in order to control an amount or a rate of packet flows flowing through a network in which the packet switch is provided.

Weizman shows a packet switch wherein each input side transfer unit is a bidirectional port, that is, an input as well as output port (Fig. 1; bidirectional line between the repeater/switch and end terminals). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the switch of Aimoto to obtain congestion status on the input port as well as Aimoto obtains congestion status for output ports and can be added together to form comprehensive congestion status to avoid data loss/discard at the input ports and conserve network resources.

Fichou et al. show a packet switch wherein it carries out congestion control (Col. 5, lines 24-25) using the comprehensive congestion status in order to control an amount or a rate of packet flows flowing through a network in which the packet switch is provided (Col. 12, lines 44-54; to provide congestion control, causing the switch to transfer packets at a rate less than the maximum transfer rate; Claim 5). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the switch of Aimoto to regulate traffic flow to avoid packet discard and conserve network resources.

15. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aimoto (6,967,924), in view of Ganesh et al. (6,347,087), in further view of Weizman (5,940,399), further in view of Peyrovian et al. (6,707,800).

As to claim 15, Aimoto shows a packet switch (Fig. 1, unit 100) wherein a plurality of input side transfer units (Fig. 1, units 102-1 – 102-N; Col. 5, lines 38-40) from which packets are entered; a plurality of output side transfer units (Fig. 1, units 108-1 – 108-N; Col. 5, lines 41-43) from which packets are outputted; a switching unit (Fig. 1, unit 120; Col. 5, lines 45-47) through which each packet entered from each input side transfer unit is switched to a desired output side transfer unit, the switching unit having a configuration in which no packet collision occurs (Col. 6, lines 57; no congestion suggests no collision); a congestion status monitoring unit (Fig. 1, unit 106; Col. 5, lines 50-51) configured to monitor a congestion status of one of said output side transfer units

(Col. 4, lines 3-5, output ports) to which a packet from one of said input side transfer units (Col. 4, lines 5-6) is destined to reach within the switching unit (Col. 4, lines 2-7; Fig. 1, unit 100), and congestion status of one of said output side transfer units to which a packet from one of said input side transfer is destined to reach within the switching unit (Col. 4, lines 3-5, output ports) which is monitored by the congestion status monitoring unit (Fig. 1, unit 106; Col. 5, lines 50-51).

However, Aimoto does not show a packet switch wherein connection pattern calculation engine configured to attach a priority level to each packet, carry out a simulation in which each packet is assumed to be transferred through a virtual switching network having a topology in which a packet collision may occur and a packet to be transferred at higher priority among colliding packets is selected according to the priority level attached to each colliding packet when the packet collision occurs in the virtual switching network, and determine a connection pattern of the switching unit such that a result of switching packets at the switching unit coincides with a result of transferring packets from the input side transfer units to the output side transfer units according to the simulation.

Ganesh et al. show a packet switch (Fig. 1, unit 20) comprising a connection pattern calculation engine (priority level-attaching unit) (Fig. 3, unit 60) configured to attach a priority level to each packet (Fig. 3, unit 60/content-based forwarding logic changes/(attaches a new) the priority of the incoming frame/packet in the ingress port/unit 74; Col. 6, lines 10-14).

Peyrovian et al. show a packet switch (Fig. 1, unit 14) wherein it carries out a simulation (Col. 3, lines 45-47; simulation is interpreted as processing of packets) in which each packet is assumed to be transferred through a virtual switching network (Fig. 1, lines 22) having a topology in which a packet collision may occur (Col. 5, lines 65-66). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the switch of Aimoto to check for collisions to avoid data loss by avoiding collisions.

Weizman shows a packet switch wherein a packet (Fig. 5) to be transferred at higher priority among colliding packets is selected according to the priority level attached to each colliding packet when the packet collision occurs in the virtual switching network (Col. 11, lines 18-27; "when there is a collision, frame transmission priority of the frames involved in the collision can be examined by the arbiter and the station or port with the higher priority frame to transmit can be given permission to transmit first"; Col. 1, lines 43-45 show virtual communication links for point to point networks/circuits). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Aimoto to provide quality of service to higher priority data.

As to claim 16, Aimoto shows a packet switch (Fig. 1, unit 100) wherein the switching unit (Fig. 1, unit 100) is formed by a cross-bar switch (Fig. 1, unit 120) , and

the virtual switching network is a switching network formed by switching elements (Col. 1, lines 40-43; shows VPIs and VCIs being attached to packets in the switching network).

16. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ganesh et al. (6,347,087) in view of Aimoto (6,967,924).

As to claim 18, Ganesh et al. show a computer program product wherein a second computer readable program code (Fig. 3, flowchart is generated using computer program) for causing said one or a plurality of computers to attach the priority level to each packet (Fig. 3, unit 60/content-based forwarding logic changes/(attaches a new) the priority of the incoming frame/packet in the ingress port/unit 74; Col. 6, lines 10-14).

However, Ganesh et al. do not show a first computer readable program code for causing said one or a plurality of computers to monitor a congestion status of one of said output side transfer units to which a packet from one of said input side transfer units is destined to reach within the packet switch.

Aimoto shows a computer program product wherein a first computer readable program code for causing said one or a plurality of computers to monitor a congestion status (Col. 4, line 3) of one of said output side transfer units (Col. 4, lines 4-5, output ports) to which a packet from one of said input side transfer units (Col. 4, lines 4-6) is

destined to reach within the packet switch (Col. 4, lines 2-7; Fig. 1, unit 100). Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention to modify the apparatus of Ganesh et al. to include setting priority in the ingress port based on the congestion of the output port to avoid further network congestion and avoid loss of data wherein data is lost/discarded if there is heavy congestion.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Any inquiry concerning this communication or earlier communications from the examiner should be directed to VAIBHAV (MANU) SAWHNEY whose telephone number is 571-272-9738. The examiner can normally be reached on Monday - Friday 1000 - 1930 EST, altern. fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, KWANG B. YAO can be reached on 571-272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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